

VIII. *An Account of some Magnetical Experiments, shewed before the Royal Society, by Mr. Gowan Knight, on Thursday the 15th of November, 1744.*

Read Nov. 15. 1744. **M**R. Knight, of *Magdalen-College* in *Oxford*, being introduced to a Meeting of the *Royal Society* on *Thursday* the 15th of *November*, 1744, produced, before the Gentlemen there present, several curious artificial Magnets contrived by himself; some of which consisted of plain Bars of Steel naked, and other of Bars or Blocks of the same Substance, armed with Iron after the common manner of natural Loadstones: But, as he was apprehensive the Trials he had before made of the Weights these Magnets were respectively capable of lifting, could hardly be repeated with sufficient Exactness and Advantage before so large a Company, he desired to refer himself, for those Particulars, to what the *President* of the *Society* had seen at his Lodgings on *Wednesday* the 7th, and on *Tuesday* the 13th, of the same Month of *November*.

Whereupon the *President* acquainted the Company, that he had lately been several times at Mr. Knight's Lodgings, where he had seen many Experiments made with his artificial Magnets; and that, particularly on the Days above-mentioned, he had been present, and had taken Minutes of the following Trials then made by that Gentleman; by which it appeared, that,

A small eight-corner'd Bar of Steel, of the Length of 3 Inches, and almost 7 Tenths, and of the Weight of about half an Ounce *Troy*, lifted by one of its Ends about 11 of the same Ounces.

That another plain Bar of Steel of a Parallelopiped Form, of the Length of 5 Inches and 9 Tenths, the Breadth of four Tenths, and the Thickness of two Tenths of an Inch, weighing 2 Ounces 8 Pennyweight and a half, lifted, in like manner, by one of its Ends 20 *Troy* Ounces.

That a Steel Bar, almost of the same Form as the last, but only 4 Inches in Length, capped or armed with Iron at each End, cramped with Silver, and weighing all together one Ounce fourteen Pennyweight, lifted by the Feet of the Armour full four Pounds *Troy*.

That a single Block of Steel of a Parallelopiped Form, almost 4 Inches long, 1 Inch and 2 Tenths in Height, and 4 Tenths of an Inch in Thickness, armed with Iron, cramped with Brass, suspended by a Ring of the same, and weighing all together 14 Ounces 1 Pennyweight, lifted by the Feet of the Armour 14 Pounds 2 Ounces and an half, *Troy* Weight.

That a compound artificial Magnet was also tried, consisting of 12 Bars of Steel armed; and that it was found to lift by the Feet of the Armour as the last, 23 *Troy* Pounds, 2 Ounces and an half.

The 12 Bars, composing this last Magnet, were each a little more than 4 Inches long, 3 Tenths of an Inch in Breadth, and 16 Hundredths of the same in Depth, weighing one with another about 25 Pennyweight each. They were all placed one upon another

other, so as to make together one Parallelopiped Body, of the common Length and Breadth of the several Bars, but of the Height of near 2 Inches, being the Sum of the respective Thicknesses of all the Bars taken together : And this Parallelopiped Body, being cramped with Brass, and fitted with an Handle of the same Metal, was armed at the 2 Ends that were made up of the common Extremities of all the Bars, with 2 substantial Pieces of Iron, after the common manner of arming natural Loadstones, the whole Frame weighing together about 20 *Troy* Ounces.

Besides these, the President made also the following Report of some Trials he had seen made at the same time of the Effects of an Art Mr. *Knight* is Master of, by which he can improve or increase the lifting Powers of natural Loadstones.

He carried with him, on *Wednesday* the 7th of *November*, a small armed Loadstone belonging to an Acquaintance, which weigh'd, with its Armour, 7 Pennyweight 14 Grains ; but which, being reputed but of an ungenerous Nature, took up, and with some Difficulty, barely 2 Ounces. Mr. *Knight* took it into his Study, and, returning it in about a Minute, it then took up better than 4 Ounces with Ease : But, upon his saying, it would still gain some more Strength, by remaining with him some time, it was left till the 13th, when it took up distinctly, with the same *Apparatus* as before, 6 Ounces 18 Penny-weights and 3 Grains ; since which time it has also several times been found to lift nearly the same Quantity.

Mr. *Knight* further, at the same time, shew'd the President the following Instances of his Ability to
invert

invert or change the Direction of the Poles in natural Loadstones.

Such a Stone belonging to Mr. *Francis Hauksbee*, weighing about 5 Ounces and 14 Pennyweights, of an irregular cylindrical Form, with 2 of the Sides somewhat flatted, upon which Armour had formerly been applied, had the Direction of its Polarity from one of these flatted Sides to the other, notwithstanding the Stone had a distinct Grain running at right Angles to that Direction. It was tried and observed, that one of these flatted Sides strongly attracted the North End, and repelled the South; and that the other attracted the South, and repelled the North End of the magnetic Needle. The End of the Stone, attracting the South End of the Needle, was then marked, by the rubbing of a Piece of Silver upon it, as upon a Touchstone: After which, Mr. *Knight* carried the Stone into his Study; and, re-producing it in about a Minute, shew'd, that the Poles were then directly inverted; and that the same End, which before attracted the South End of the Needle, now attracted the North, and repelled the South, and *vice versa*.

After this, Mr. *Knight*, again taking the Stone, brought it back in as short a time as before, with the Direction of its Polarity turned at right Angles to its former Direction, and into the Direction of the natural Grain of the Stone, the Poles now lying in the flat Ends of the Cylinder; one of which, being the smoother End, attracted the South End of the Needle, whilst the other, which was of a rougher Texture, attracted the North End, and repelled the South End of the same: When it was also observed, that the Polarity

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appeared

appeared stronger in this Case, than either of the former.

Lastly, Mr. *Knight*, in about the same time, inverted this last Direction of the Poles, keeping it still parallel to the Axis of the Cylinder, but causing the smooth End of the Stone to attract the North End of the magnetic Needle, and the rough End to attract the South, and repel the North End of the same Needle.

After this Report, Mr. *Knight* proceeded to shew, at the Meeting, some of the same artificial Magnets therein mentioned; and it was found, that the compound Magnet, consisting of 12 Steel-Bars, and which had, in the Experiment made before the President, lifted 23 Pounds 2 Ounces and an half *Troy* Weight, did here, under all the Inconveniencies and Disadvantages of a crowded Room, still lift a Weight amounting to 21 Pounds and 11 of the same Ounces.

It was also found, that the single armed Block of Steel, which had before lifted 14 Pounds and 2 Ounces, did here, under the same Disadvantages as the former, lift 13 Pounds and 7 Ounces of like *Troy* Weight.

And, lastly, Mr. *Knight* produced to the Company the above-mentioned natural Loadstone belonging to Mr. *Hawksbee*, but with the Direction of its Polarity again altered from what it was, when it was last seen by the President.

P. S. Since the artificial Magnets mentioned in the foregoing Paper, Mr. *Knight* has caused some others to be made of a lesser Size, but of a very great lifting Power: And one of these, weighing

weighing without its Armour just an Ounce, and with the Armour, Cramps, and Rings, 1 Ounce 17 Pennyweights, lifted, before the President of the *Society*, on *Friday* the 27th of *July* 1745, 6 Pounds and 10 Ounces *Troy* Weight.

This Magnet consisted of 3 Plates of Steel, each 2 Inches long, 7 Tenths of an Inch in Breadth, and not above 6 Hundreths of an Inch in Thickness: They were laid flat upon each other, and screwed together by 2 small Brass Screws going through the 3 Plates. After which, the little Parallelopiped Block so made up, was armed with Iron at the 2 Ends, cramped together with Silver, and fitted with a double Ring of the same Metal, for the convenient holding of it.

IX. *Abstract of what is contained in a Book concerning Electricity, just published at Leipzig, 1744. by John Henry Wintler, Greek and Latin Professor there; from Article 75 to Article 79.*

Read Nov. 22. 1744. **T**HE electrical Sparks from Metals, such as Iron and Silver, are capable of kindling all such Fluids as may be otherwise kindled by actual Flame. And this Experiment succeeds best, when the *quinta Essentia vegetabilis* is held in a Spoon under the Cross of a Sword, whose Point is turned towards the electrifying Glass (TAB. II. Fig. 4.). In like manner, the same Spirits may easily be set on Fire,